

CLAIMS

What is claimed is:

1. A method for preventing or treating toxicity due to a pyrimidine nucleoside analog comprising administering to an animal a pharmaceutically effective amount of an acylated derivative of a non-methylated pyrimidine nucleoside.
2. A method as in claim 1 wherein said acylated derivative of a non-methylated pyrimidine nucleoside is an acyl derivative of uridine, cytidine, deoxycytidine, or deoxyuridine.
3. A method as in claim 1 wherein said toxicity is damage to hematopoietic tissue.
4. A method as in claim 1 wherein said toxicity is damage to mucosal tissues.
5. A method as in claim 1 wherein said pyrimidine nucleoside analog is an antineoplastic agent.
6. A method as in claim 1 wherein said pyrimidine nucleoside analog is an antiviral agent.
7. A method as in claim 1 wherein said pyrimidine nucleoside analog is an antimalarial agent.
8. A method as in claim 1 wherein said pyrimidine nucleoside analog is a cytotoxic analog of uridine.

9. A method as in claim 1 wherein said pyrimidine nucleoside analog is a cytotoxic analog of cytidine.

10. A method as in claim 1 wherein said pyrimidine nucleoside analog is an inhibitor of pyrimidine nucleotide biosynthesis.

11. A method as in claim 1 wherein said pyrimidine nucleoside analog is selected from the group consisting of 5-fluorouracil (5-FU), 5-FU prodrugs including tegafur and 5'-deoxyfluorouridine, fluorouridine, 2'-deoxyfluorouridine, prodrug derivatives of fluorouridine or 2'- deoxyfluorouridine, fluorocytosine, trifluoro-methyl-2'-deoxyuridine, arabinosyl cytosine, prodrugs of arabinosyl cytosine, cyclocytidine, 5-aza-2'-deoxycytidine, arabinosyl 5-azacytosine, 6-azacytidine, N-phosphonoacetyl-L-aspartic acid (PALA), pyrazofurin, 6-azauridine, azaridine, thymidine, and 3-deazauridine.

12. A method as in claim 1 wherein said pyrimidine nucleoside analog is selected from the group consisting of AZT, dideoxycytidine, 5-ethyl-2'-deoxyuridine, 5-iodo-2'-deoxyuridine, 5-bromo-2'-deoxyuridine, 5-methylamino-2'-deoxyuridine, arabinosyluracil, dideoxyuridine and (S)-1-(3-hydroxy-2-phosphonylmethoxypropyl) cytosine.

13. A method as in claim 1 wherein said pyrimidine nucleoside analog is 5-fluoroorotate.

14. A method as in claim 1 wherein said acylated derivative of a non-methylated pyrimidine nucleoside is triacetyluridine.

15. A method as in claim 1 wherein said acyl derivative of a non-methylated pyrimidine nucleoside is ethoxycarbonyluridine.

16. A method as in claim 1 wherein said acylated derivative of a non-methylated pyrimidine nucleoside is triacetylcytidine.

17. A method as in claim 1 wherein said acylated derivative of a non-methylated pyrimidine nucleoside is diacetyldeoxycytidine.

18. A method as in claim 1 wherein said acylated derivative of a non-methylated pyrimidine nucleoside is an acylated derivative of uridine, deoxyuridine, or cytidine, and said administering step also includes administering an inhibitor of uridine phosphorylase.

19. A method as in claim 18 wherein said inhibitor of uridine phosphorylase is selected from the group consisting of benzylacyclouridine, benzyloxybenzylacyclouridine, aminomethyl-benzylacyclouridine, aminomethyl-benzyloxybenzylacyclouridine, hydroxymethyl-benzylacyclouridine, and hydroxymethyl-benzyloxybenzylacyclouridine, 2,2'-anhydro-5-ethyluridine, 5-benzyl barbiturate, 5-benzyloxybenzyl barbiturate, 5-benzyloxybenzyl-1-[(1-hydroxy-2-ethoxy)methyl] barbiturate,

5-benzyloxybenzylacetyl-1-[(1-hydroxy-2-ethoxy)methyl] barbiturate, and 5-methoxybenzylacetylacyclobarbiturate.

20. A method as in claim 1 wherein said acylated derivative of a non-methylated pyrimidine nucleoside is an acylated derivative of cytidine or deoxycytidine, and said administering step also includes administering an inhibitor of cytidine deaminase.

21. A method as in claim 20 wherein said inhibitor of cytidine deaminase is selected from the group consisting of tetrahydouridine or tetrahydro-2'-deoxyuridine.

22. A method as in claim 1 wherein said acylated derivative of a non-methylated pyrimidine nucleoside is an acylated derivative of uridine, cytidine or deoxycytidine, and said administering step also includes administering an inhibitor of nucleoside transport.

23. A method as in claim 22 wherein said inhibitor of nucleoside transport is selected from the group consisting of dipyridamole, probenicid, lidoflazine or nitrobenzylthioinosine.

24. A method as in claim 1 wherein said administering step also includes administering an agent which enhances hematopoiesis.

25. A method as in claim 1 wherein said administering step also includes administering a compound capable of enhancing the uptake and phosphorylation of nucleosides into cells.

26. A method for preventing an opportunistic infection after chemotherapy comprising administering to an animal a pharmaceutically effective amount of an acyl derivative of a non-methylated pyrimidine nucleoside.

27. A method for treating cancer comprising:

- (a) administering a pyrimidine nucleoside analog, and
- (b) administering a pharmaceutically effective amount of an acyl derivative of a non-methylated pyrimidine nucleoside.

28. A method as in claim 27 wherein said pyrimidine nucleoside analog is selected from the group consisting of 5-fluorouracil (5-FU), 5-FU prodrugs including tegafur and 5'-deoxyfluorouridine, fluorouridine, 2'-deoxyfluorouridine, prodrug derivatives of fluorouridine or 2'- deoxyfluorouridine, fluorocytosine, trifluoro-methyl-2'-deoxyuridine, arabinosyl cytosine, prodrugs of arabinosyl cytosine, cyclocytidine, 5-aza-2'-deoxycytidine, arabinosyl 5-azacytosine, 6-azacytidine, N-phosphonoacetyl-L-aspartic acid (PALA), pyrazofurin, 6-azauridine, azaridine, thymidine, and 3-deazauridine.

29. A method as in claim 27 wherein said pyrimidine nucleoside analog is a 5-fluoropyrimidine or 5-fluoropyrimidine nucleoside analog and said acyl derivative of a non-methylated pyrimidine nucleoside is an acyl derivative of uridine, cytidine, or deoxyuridine.

30. A method as in claim 29 wherein said 5-fluoropyrimidine or 5-fluoropyrimidine nucleoside analog is selected from the group consisting of 5-fluorouracil, 5-

fluorouracil prodrugs including tegafur and 5'-deoxyfluorouridine, fluorouridine, 2'-deoxyfluorouridine, prodrug derivatives of fluorouridine, prodrug derivatives of 2'- deoxyfluorouridine, 5-fluorocytosine, 5-fluorocytidine, or prodrug derivatives of 5-fluorocytidine.

31. A method as in claim 27 wherein said pyrimidine nucleoside analog is N-phosphonoacetyl-L-aspartic acid (PALA), pyrazofurin, 6-azauridine, azaridine, trifluoromethyl-2'-deoxyuridine, or 3-deazauridine and said acyl derivative of a non-methylated pyrimidine nucleoside is an acyl derivative of uridine or cytidine.

32. A method as in claim 27 wherein said acyl derivative of a non-methylated pyrimidine nucleoside is an acyl derivative of uridine, cytidine, deoxycytidine or deoxyuridine.

33. A method as in claim 27 wherein said acyl derivative of a non-methylated pyrimidine nucleoside is triacetyluridine.

34. A method as in claim 27 wherein said acyl derivative of a non-methylated pyrimidine nucleoside is ethoxycarbonyluridine.

35. A method as in claim 27 wherein said acyl derivative of a non-methylated pyrimidine nucleoside is triacetylcytidine.

36. A method as in claim 27 wherein said acyl derivative of a non-methylated pyrimidine nucleoside is diacetyldeoxycytidine.

37. A method as in claim 27 wherein said pyrimidine nucleoside analog is an antineoplastic analog of cytidine and said acyl derivative of a non-methylated pyrimidine nucleoside is an acyl derivative of deoxycytidine.

38. A method as in claim 37 wherein said antineoplastic analog of cytidine is arabinosyl cytosine or prodrugs thereof, cyclocytidine, 5-aza-2'-deoxycytidine, arabinosyl 5-azacytosine, or 6-azacytidine.

39. A method as in claim 27 wherein said pyrimidine nucleoside analog is an analog of uridine, said acylated derivative of a non-methylated pyrimidine nucleoside is an acylated derivative of uridine, deoxyuridine, or cytidine, and said administering step (b) also includes administering an inhibitor of uridine phosphorylase.

40. A method as in claim 39 wherein said inhibitor of uridine phosphorylase is selected from the group consisting of benzylacyclouridine, benzyloxybenzylacyclo-uridine, aminomethyl-benzylacyclouridine, aminomethyl-benzyloxybenzylacyclouridine, hydroxymethyl-benzylacyclouridine, hydroxymethyl-benzyloxybenzylacyclouridine, 2,2'-anhydro-5-ethyluridine, 5-benzyl barbiturate, 5-benzyloxybenzyl barbiturate, 5-benzyloxybenzyl-1-[(1-hydroxy-2-ethoxy)methyl] barbiturate,

5-benzyloxybenzylacetyl-1-[(1-hydroxy-2-ethoxy)methyl] barbiturate, and 5-methoxybenzylacetylacyclobarbiturate.

41. A method as in claim 27 wherein said acylated derivative of a non-methylated pyrimidine nucleoside is an acylated derivative of cytidine or deoxycytidine, and said administering step (b) also includes administering an inhibitor of cytidine deaminase.

42. A method as in claim 41 wherein said inhibitor of cytidine deaminase is selected from the group consisting of tetrahydouridine or tetrahydro-2'-deoxyuridine.

43. A method as in claim 27 wherein said acylated derivative of a non-methylated pyrimidine nucleoside is an acylated derivative of uridine, cytidine or deoxycytidine, and said administering step (b) also includes administering an inhibitor of nucleoside transport.

44. A method as in claim 43 wherein said inhibitor of nucleoside transport is selected from the group consisting of dipyridamole, probenicid, lidoflazine or nitrobenzylthioinosine.

45. A method as in claim 27 wherein said administering step (b) also includes administering an agent which enhances hematopoiesis.

46. A method as in claim 27 wherein said administering step (b) also includes administering a compound capable of enhancing the uptake and phosphorylation of nucleosides into cells.

47. A method as in claim 27 wherein said administering step (a) also includes administering AZT.

48. A method for treating a viral infection comprising:

- (a) administering a pyrimidine nucleoside analog, and
- (b) administering a pharmaceutically effective amount of an acyl derivative of a non-methylated pyrimidine nucleoside.

49. A method as in claim 48 wherein said viral infection is AIDS.

50. A method as in claim 48 wherein said viral infection is herpes.

51. A method as in claim 48 wherein said viral infection is hepatitis.

52. A method as in claim 48 wherein said pyrimidine nucleoside analog is selected from the group consisting of AZT, dideoxycytidine, 2',3'-dideoxycytidin-2'-ene, 3'-deoxythymidin-2'-ene, 3'-azido-2',3'-dideoxyuridine, 5-ethyl-2'-deoxyuridine, 5-iodo-2'-deoxyuridine, 5-bromo-2'-deoxyuridine, 2',3'-dideoxy-3'-fluorothymidine, 5-methylamino-2'-deoxyuridine, arabinosyluracil, dideoxyuridine and (S)-1-(3-hydroxy-2-phosphonylmethoxypropyl) cytosine.

53. A method as in claim 48 wherein said acyl derivative of a non-methylated pyrimidine nucleoside is an acyl derivative of uridine, cytidine, deoxycytidine or deoxyuridine.

54. A method as in claim 48 wherein said acyl derivative of a non-methylated pyrimidine nucleoside is triacetyluridine.

55. A method as in claim 48 wherein said acyl derivative of a non-methylated pyrimidine nucleoside is ethoxycarbonyluridine.

56. A method as in claim 48 wherein said acyl derivative of a non-methylated pyrimidine nucleoside is triacetylcytidine.

57. A method as in claim 48 wherein said an acyl derivative of a non-methylated pyrimidine nucleoside is diacetyldeoxycytidine.

58. A method as in claim 48 wherein said pyrimidine nucleoside analog is AZT and said acyl derivative of a non-methylated pyrimidine nucleoside is an acyl derivative of uridine, cytidine, or deoxycytidine.

59. A method as in claim 48 wherein said pyrimidine nucleoside analog is dideoxycytidine said acyl derivative of a non-methylated pyrimidine nucleoside is an acyl derivative of deoxycytidine.

60. A method as in claim 48 wherein said acylated derivative of a non-methylated pyrimidine nucleoside is an acylated derivative of uridine, deoxyuridine, or cytidine, and said administering step (b) also includes administering an inhibitor of uridine phosphorylase.

61. A method as in claim 60 wherein said inhibitor of uridine phosphorylase is selected from the group consisting of benzylacyclouridine, benzyloxybenzylacyclouridine, aminomethyl-benzylacyclouridine, aminomethyl-benzyloxybenzylacyclouridine, hydroxymethyl-benzylacyclouridine, hydroxymethyl-benzyloxybenzyl-acyclouridine, 2,2'-anhydro-5-ethyluridine, 5-benzyl barbiturate, 5-benzyloxybenzyl barbiturate, 5-benzyloxybenzyl-1-[(1-hydroxy-2-ethoxy)methyl] barbiturate, 5-benzyloxybenzylacetyl-1-[(1-hydroxy-2-ethoxy)methyl] barbiturate, and 5-methoxybenzylacetylacyclobarbiturate.

62. A method as in claim 48 wherein said acylated derivative of a non-methylated pyrimidine nucleoside is an acylated derivative of cytidine or deoxycytidine, and said administering step (b) also includes administering an inhibitor of cytidine deaminase.

63. A method as in claim 62 wherein said inhibitor of cytidine deaminase is selected from the group consisting of tetrahydouridine or tetrahydro-2'-deoxyuridine.

64. A method as in claim 48 wherein said acylated derivative of a non-methylated pyrimidine nucleoside is an acylated derivative of uridine, cytidine or deoxycytidine, and said administering step (b) also includes administering an inhibitor of nucleoside transport.

65. A method as in claim 64 wherein said inhibitor of nucleoside transport is selected from the group consisting of dipyridamole, probenicid, lidoflazine or nitrobenzylthioinosine.

66. A method as in claim 48 wherein said administering step (b) also includes administering an agent which enhances hematopoiesis.

67. A method as in claim 48 wherein said administering step (b) also includes administering a compound capable of enhancing the uptake and phosphorylation of nucleosides into cells.

68. A method for treating a viral infection comprising:

(a) administering a pyrimidine nucleoside analog, and
(b) administering a pharmaceutically effective amount of an inhibitor of deoxycytidine deaminase.

69. A method as in claim 68 wherein said pyrimidine analog is selected from the group consisting of AZT or dideoxycytidine.

70. A method as in claim 68 wherein said inhibitor of deoxycytidine deaminase is tetrahydouridine or tetrahydro-2'-deoxyuridine.

71. A method for treating a malarial infection comprising:

(a) administering a pyrimidine nucleoside analog, and

(b) administering a pharmaceutically effective amount of an acyl derivative of a non-methylated pyrimidine nucleoside.

72. A method as in claim 71 wherein said pyrimidine nucleoside analog is 5-fluoroorotate and said acyl derivative of a non-methylated pyrimidine nucleoside is an acyl derivative of uridine or cytidine.

73. A method as in claim 71 wherein said acylated derivative of a non-methylated pyrimidine nucleoside is an acylated derivative of uridine or cytidine, and said administering step (b) also includes administering an inhibitor of uridine phosphorylase.

74. A method as in claim 73 wherein said inhibitor of uridine phosphorylase is selected from the group consisting of benzylacyclouridine, benzyloxybenzylacyclouridine, aminomethyl-benzylacyclouridine, aminomethyl-benzyloxybenzylacyclouridine, hydroxymethyl-benzylacyclouridine, hydroxymethyl-benzyloxybenzylacyclouridine, 2,2'-anhydro-5-ethyluridine, 5-benzyl barbiturate, 5-benzyloxybenzyl barbiturate, 5-benzyloxybenzyl-1-[(1-hydroxy-2-ethoxy)methyl] barbiturate, 5-benzyloxybenzylacetyl-1-[(1-hydroxy-2-ethoxy)methyl] barbiturate, and 5-methoxybenzylacetylacyclobarbiturate.

75. A composition comprising:
an acyl derivative of a non-methylated pyrimidine nucleoside
;and
an antineoplastic agent.

76. A composition as in claim 75 wherein said antineoplastic agent is selected from the group consisting of 5-fluorouracil (5-FU), 5-FU prodrugs including tegafur and 5'-deoxyfluorouridine, fluorouridine, 2'- deoxyfluorouridine, prodrug derivatives of fluorouridine or 2'- deoxyfluorouridine, fluorocytosine, trifluoro-methyl-2'- deoxyuridine, arabinosyl cytosine, prodrugs of arabinosyl cytosine, cyclocytidine, 5-aza-2'-deoxycytidine, arabinosyl 5-azacytosine, 6-azacytidine, N-phosphonoacetyl-L-aspartic acid (PALA), pyrazofurin, 6-azauridine, azaridine, thymidine, and 3-deazauridine.

77. A composition as in claim 75, wherein said acyl derivative of a non-methylated pyrimidine nucleoside is a an acyl derivative of cytidine, and said antineoplastic agent is an analog of cytidine. *a*

78. A composition as in claim 77 wherein said antineoplastic analog of cytidine is arabinosyl cytosine or prodrugs thereof, cyclocytidine, 5-aza-2'-deoxycytidine, arabinosyl 5-azacytosine, or 6-azacytidine.

79. A composition as in claim 75, wherein said acyl derivative of a non-methylated pyrimidine nucleoside is deoxycytidine, and said antineoplastic agent is an analog of cytidine.

80. A composition as in claim 79 wherein said analog of cytidine is arabinosyl cytosine or prodrugs thereof, cyclocytidine, 5-aza-2'-deoxycytidine, arabinosyl 5-azacytosine, or 6-azacytidine.

81. A composition as in claim 75, wherein said acyl derivative of a non-methylated pyrimidine nucleoside is an acyl derivative of uridine, and said antineoplastic agent is a fluorinated pyrimidine.

82. A composition as in claim 81 wherein said fluorinated pyrimidine is tegafur, 5'-deoxyfluorouridine, 5-fluorouracil, 5-fluorouridine, N⁴-trimethoxybenzoyl-5'-deoxy-5-fluorocytidine, or 2'deoxy-5-fluorouridine, or acyl derivatives thereof.

83. A composition as in claim 81, wherein the molar ratio of said acyl derivative of uridine to said fluorinated pyrimidine is 1:1 to 12:1.

84. A composition as in claim 81, wherein the molar ratio of said acyl derivative of uridine to said fluorinated pyrimidine is 2:1 to 8:1.

85. A composition as in claim 81, wherein the molar ratio of said acyl derivative of uridine to said fluorinated pyrimidine is 4:1.

86. A composition as in claim 81, wherein said acyl derivative of uridine is triacetyluridine, and said antineoplastic agent is a fluorinated pyrimidine.

87. A composition as in claim 81, wherein said acyl derivative of uridine is triacetyluridine, and said antineoplastic agent is tegafur.

88. A composition comprising:
an acyl derivative of a non-methylated pyrimidine nucleoside

; and
an antiviral agent.

89. A composition as in claim 88, wherein said acyl derivative of a non-methylated pyrimidine nucleoside is an acyl derivative of uridine, cytidine, or deoxycytidine, and said antiviral agent is AZT.

90. A composition as in claim 88 wherein said antiviral agent is selected from the group consisting of AZT, dideoxycytidine, 2',3'-dideoxycytidin-2'-ene, 3'-deoxythymidin-2'-ene, 3'-azido-2',3'-dideoxyuridine, 5-ethyl-2'-deoxyuridine, 5-iodo-2'-deoxyuridine, 5-bromo-2'-deoxyuridine, 2',3'-dideoxy-3'-fluorothymidine, 5-methylamino-2'-deoxyuridine, arabinosyluracil, dideoxyuridine and (S)-1-(3-hydroxy-2-phosphonylmethoxypropyl) cytosine.

91. A composition comprising:
an acyl derivative of a non-methylated pyrimidine nucleoside
; and
an antimalarial agent.

92. A composition as in claim 91, wherein said acyl derivative of a non-methylated pyrimidine nucleoside is an acyl derivative of uridine or cytidine, and said antimalarial agent is 5-fluoroorotate.

93. A composition as in claim 91 wherein said antimalarial agent is selected from the group consisting of 5-fluoroorotate, PALA, or 6-azauridine.

94. A composition comprising:

an acyl derivative of a non-methylated pyrimidine nucleoside ; and

an agent which enhances hematopoiesis.

95. A composition as in claim 94, wherein said agent which enhances hematopoiesis is selected from the group consisting of a nonionic surfactant, an interleukin, a colony-stimulating factor, erythropoietin, glucan, and polyinosine-polycytidine.

96. A composition as in claim 94, wherein said agent which enhances hematopoiesis is an oxypurine nucleoside, a congener of an oxypurine nucleoside, or an acyl derivative of an oxypurine nucleoside or an oxypurine nucleoside congener.

97. A composition comprising:

an acyl derivative of a non-methylated pyrimidine nucleoside ; and

a compound capable of enhancing the uptake and phosphorylation of nucleosides into cells.

98. A composition as in claim 97, wherein said compound capable of enhancing uptake and phosphorylation of nucleosides into cells is selected from the group consisting of insulin and an insulinogenic carbohydrate.

99. A composition comprising

an acyl derivative of a non-methylated pyrimidine nucleoside ; and

an agent capable of promoting healing of mucosal tissue.

100. A composition as in claim 99 wherein said agent capable of promoting healing of mucosal tissue is selected from the group consisting of sucralfate, a mixture of two or more deoxyribonucleosides, allopurinol, an antibiotic or a local anesthetic.

101. A composition comprising

an acyl derivative of uridine

; and

a compound capable of inhibiting uridine phosphorylase.

102. A composition as in claim 101 wherein said inhibitor of uridine phosphorylase is selected from the group consisting of benzylacyclouridine, benzyloxybenzylacyclouridine, aminomethyl-benzylacyclouridine, aminomethyl-benzyloxybenzylacyclouridine, hydroxymethyl-benzylacyclouridine, hydroxymethyl-benzyloxybenzylacyclouridine, 2,2'-anhydro-5-ethyluridine, 5-benzyl barbiturate, 5-benzyloxybenzyl barbiturate, 5-benzyloxybenzyl-1-[(1-hydroxy-2-ethoxy)methyl] barbiturate, 5-benzyloxybenzylacetyl-1-[(1-hydroxy-2-ethoxy)methyl] barbiturate, and 5-methoxybenzylacetylacyclobarbiturate.

103. A composition comprising:

an acyl derivative of cytidine or deoxycytidine

; and

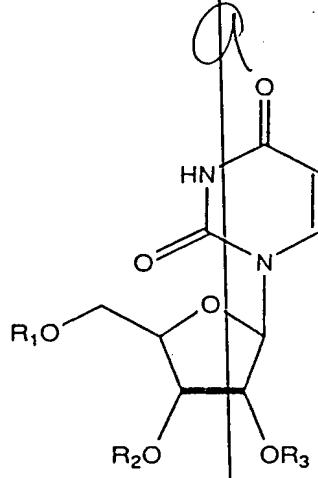
a compound capable of inhibiting deoxycytidine deaminase.

104. A composition as in claim 103 wherein said inhibitor of cytidine deaminase is selected from the group consisting of tetrahydouridine or tetrahydro-2'-deoxyuridine.

105. A composition comprising:
an acyl derivative of uridine, cytidine, or deoxycytidine
;and
a compound capable of inhibiting nucleoside transport.

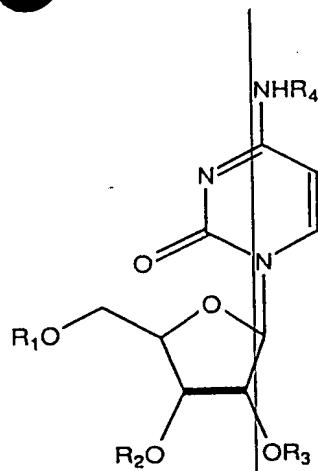
106. A method as in claim 105 wherein said inhibitor of nucleoside transport is selected from the group consisting of dipyridamole, probenicid, lidoflazine or nitrobenzylthioinosine.

107. An acyl derivative of uridine having the formula:



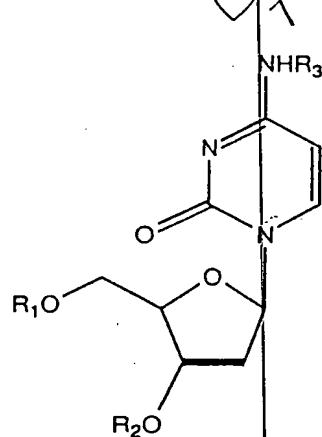
wherein at least one of R_1 , R_2 , or R_3 is a hydrocarbyloxycarbonyl moiety containing 2-26 carbon atoms and the remaining R substituents are independently a hydrocarbyloxycarbonyl or hydrocarbylcarbonyl moiety or H or phosphate.

108. An acyl derivative of cytidine having the formula:



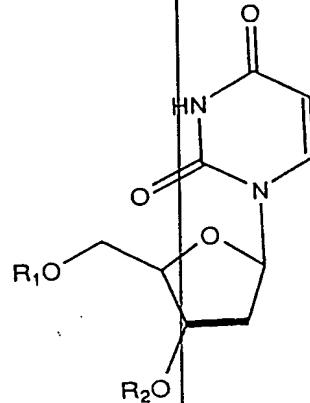
wherein at least one of R_1 , R_2 , R_3 or R_4 is a hydrocarbyloxycarbonyl moiety containing 2-26 carbon atoms and the remaining R substituents are independently a hydrocarbyloxycarbonyl or hydrocarbylcarbonyl moiety or H or phosphate.

109. An acyl derivative of deoxycytidine having the formula:



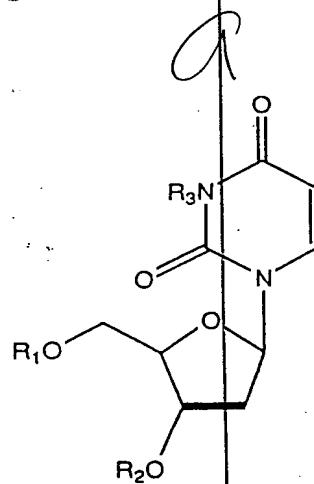
wherein at least one of R_1 , R_2 , or R_3 is a hydrocarbyloxycarbonyl moiety containing 2-26 carbon atoms and the remaining R substituents are independently a hydrocarbyloxycarbonyl or hydrocarbylcarbonyl moiety or H or phosphate.

110. An acyl derivative of deoxyuridine having the formula:



wherein at least one of R_1 or R_2 is a hydrocarbyloxycarbonyl moiety containing 2-26 carbon atoms and the remaining R substituents are independently a hydrocarbyloxycarbonyl or hydrocarbylcarbonyl moiety or H or phosphate.

111. An acyl derivative of deoxyuridine, having the formula



wherein R_1 , R_2 , and R_3 are the same, or different, and each is hydrogen or an acyl radical derived from

- a. an unbranched fatty acid with 3 to 22 carbon atoms,

b. an amino acid selected from the group consisting of glycine, the L forms of alanine, valine, leucine, isoleucine, tyrosine, proline, hydroxyproline, serine, threonine, cystine, cysteine, aspartic acid, glutamic acid, arginine, lysine, histidine, carnitine and ornithine,

c. nicotinic acid *A*

d. a dicarboxylic acid having 3-22 carbon atoms, provided that not all of R₁, R₂, and R₃ are H, and where R₃ is not H, then R₁ and/or R₂ may also be acetyl, or a pharmaceutically acceptable salt thereof.

112. A pharmaceutical composition comprising a compound of claims 107, 108, 109, 110, or 111 and a pharmaceutically acceptable carrier.